Code No. **Series AG-8-3689**

TMC-D/79/89/36

19th Year of quality education

General Instructions :
1. All question are compulsory.
2. The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 10 question of 1 mark each. Section – B comprises of 8 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 6 questions of 4 marks each.
3. Question numbers 1 to 10 in Section – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one lf the alternatives in all such questions.
5. Use of calculator is not permitted.
6. An additional 15 minutes time has been allotted to read this question paper only.

सामान्य निर्देश :
1. सभी प्रश्न अनिवार्य हैं।
2. इस प्रश्न पत्र में 34 प्रश्न है, जो चार खण्डों में अ, ब, स व द में विभाजित है। खण्ड – अ में 10 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 8 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड – द में 6 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
3. प्रश्न संख्या 1 से 10 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही विकल्प चुनें।
4. इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
5. कैलकुलेटर का प्रयोग वर्जित है।
6. इस प्रश्न–पत्र को पढ़ने के लिए 15 मिनिट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न–पत्र को पढेंगे और वे

Pre-Board Examination 2010 -11

Time : 3 to $3\frac{1}{2}$ Hours   अधिकतम समय : 3 से $3\frac{1}{2}$

Maximum Marks : 80   अधिकतम अंक : 80

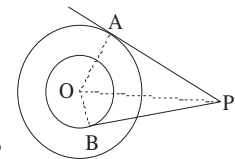Total No. Of Pages : 4   कुल पृष्ठों की संख्या : 4
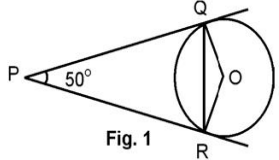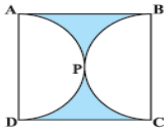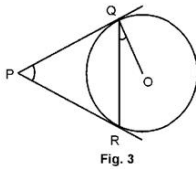
CLASS – X   *CBSE*   *MATHEMATICS*

Section A

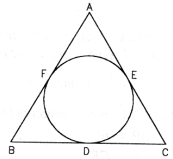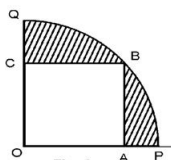|	
Q.1	Which of the following equations has the sum of its roots as 3? (a) $x^2 + 3x - 5 = 0$ (b) $-x^2 + 3x + 3 = 0$ (c) $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x - 1$ (d) $3x^2 - 3x - 3 = 0$
Q.2	Sum of first n terms of a series is $5n^2 + 2n$, then its second term is (a) 15 (b) 16 (c) 17 (d) none of these
Q.3	In the given figure, two concentric circles with centre O are of radii 5 cm and 3 cm. From an external point P, tangents PA and PB are drawn to these circles. If AP = 12 cm, find BP.

(a) (A) $4\sqrt{10}$ (B) $2\sqrt{10}$ (C) $\sqrt{10}$ (B) NONE

Q.4	In fig. 1, PQ and PR are tangents to the circle with centre O such that $\angle QPR = 50°,$ then $\angle OQR$ is Fig. 1 equal to (a) 25° (b) 30° (c) 40° (d) 50
Q.5	Two concentric circles are of radii 13cm and 5cm. The length of the chord of larger circle which touches the smaller circle is 12cm (b) 20cm (c) 24cm (d) 26cm
Q.6	To draw a pair of tangents to a circle which are inclined to each other at an angle of 100º . it is required to draw tangents at end points of those two radii of the circle, the angle between which should be (a) 100º (b) 50º(c) 80º (d) 200º
Q.7	The height of a cone is 60 *cm*. A small cone is cut off at the top by a plane parallel to the base and its volume is $\dfrac{1}{64}$ th the volume of original cone. The height from the base at which the section is made is (a) 15 *cm* (b) 30 *cm* (c) 45 *cm* (d) 20 *cm*.
Q.8	 The area of the shaded region in Fig. , if ABCD is a square of side 14 cm and APD and BPC are semicircles. (a) $24cm^2$ (b) $42cm^2$ (c) $420cm^2$ (d) none of these
Q.9	If angle between two radii of a circle is 130^0, then the angle between the tangents at the ends of the radii is (a) 90^0 (b) 50^0 (c) 70^0 (d) 40^0 .
Q.10	Which of the following cannot be the probability of an event ? (a) $\dfrac{1}{5}$ (b) 0.3 (c) 4% (d) $\dfrac{5}{4}$
	Section B
Q.11	Solve for x: $a^2b^2x^2 + b^2x - a^2x - 1 = 0$
Q.12	Rao started work in 1995 at an annual salary of ₹ 5000 and recived an increment of ₹ 200 each year . In which year did his income reach ₹ 7000 .
Q.13	Two tangents PA and PB are drawn form an external point P to a circle with center O. Prove that AOBP is a cyclic quadrilateral.
Q.14	The diameter of a circle is 84 cm. find the number of revolutions it will make in moving 792 meters. .
Q.15	How many spherical lead shots each having diameter 3 *cm.* can be made from a cuboidal lead solid of dimensions 9 *cm* ×11*cm*×12*cm* ?
Q.16	Point P(5,- 3) is one of the two points of trisection of the line segment joining the points A (7, -2) and B(1, -5) near to A. Find the coordinates of the other point of trisection.
Q.17	Find the relation between x and y if the points (x,y) , (1,2) and (7,0) are collinear.

Q.18	Two dice are thrown at the same time. Find the probability of getting different numbers on both dice.
	OR
	A jar contains 54 marbles each of which is blue , green or white . The probability of selecting a blue marbles at random from the jar is 1 / 3 , and the probability of selecting a green marble at random is 4 / 9 . How many white marble does the jar contain ?

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Section C

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Q.19	Find the roots of the equation $\dfrac{1}{2x-3}+\dfrac{1}{x-5}=1, x \neq \dfrac{3}{2},5$.
	OR
	The denominator of a fraction is 1 more than twice the numerator. The sum of the fraction and is reciprocal is $2\dfrac{16}{21}$ .Find the fraction .
Q.20	In Fig. 3 two tangents PQ and PR are drawn to a circle with centre O from an external point P. Prove that $\angle QPR = 2\angle OQR$. **Fig. 3**
	OR
	In fig. the in circle of ΔABC, touches the sides BC, CA and AB at D, E and F respectively. Show that :AF + BD + CE = AE + BF + CD = $\dfrac{1}{2}$ (Perimeter of Δ ABC)
Q.21	Draw a triangle ABC with side BC = 6 *cm* , AB =4. 5 cm and $\angle ABC = 60°$. Then construct a triangle whose sides are $\dfrac{3}{2}$ times the corresponding sides of ΔABC.
Q.22	In Fig. 4, OABC is a square inscribed in a quadrant OPBQ . OA= 20 *cm,* find the area of shaded region. $Use \pi = 3.14$. **Fig. 4**
Q.23	A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter 'l' of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.
	OR
	A hemispherical bowl of internal diameter 36 cm contains a liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. How many bottles are required to empty the bowl?
Q.24	An aero plane flying horizontally at a height of 2500 m above the ground is observed at an elevation of 60^0. If after 15 seconds, the angle of elevation is observed to be 30^0 , find the speed of the aero

	plane in km per hr.
Q.25	Prove that the points A(4, 3), B(6, 4), C(5, -6) and D(3, -7) in that order are the vertices of a parallelogram. Also prove that diagonal of parallelogram divides the triangle of equal area.
Q.26	The vertices of a triangle are (2,a), (1,b) and (c^2,-3). (i)Prove that its centroid cannot lie on the y-axis. (ii) Find the condition that the centroid may lie on the x-axis.
Q.27	Cards with numbers 2 to 101 are placed in a box. A card is selected at random from the box. Find the probability that the card which is selected has a number which is a perfect square.
Q.28	Find the number of terms in the series 20, $19\frac{1}{3}$, $18\frac{2}{3}$, …of which the sum is 300, explain the double answer.

Section D

Q.29	A train travels at a certain average speed for a distance of 63 km and then travels a distance of 72 km at an average sped of 6 km/hr more than its original speed. If it takes 3 hours to complete the total journey, what is its original average speed ? OR Some students planned a picnic. The budget for food was ₹ 500. But 5of these failed to go and thus the cost of food for each student increased by ₹ 5. How many students attended the picnic .
Q.30	A sum of Rs. 1400 is to be used to give seven cash prizes to students of a school fro their overall academic performance. If each prize is Rs. 40 less than the preceding price, find the value of each of the prizes.
Q.31	Prove that the lengths of tangents drawn from an external point to a circle are equal.
Q.32	A solid iron pole consists of a cylinder of height 110 cm and of base diameter 24 cm. which is surmounted by a cone 9 cm. high. Find the mass of the pole, given that 1 cm^3 of iron has 8 g mass. $Use\pi = 3.14$ OR 21 glass spheres each of radius 2 cm are packed in a cuboidal box of internal dimensions $16cm \times 8cm \times 8cm$ and then the box is filled with water. Find the volume of water filled in the box.
Q.33	A solid metallic right circular cone 20 cm high and whose vertical angle is 60^0 is cut into two parts at the middle point of its height by a plane parallel to the base. If the frustum, so obtained, be drawn into a wire of diameter $\frac{1}{16}$ cm, find the length of the wire.
Q.34	From a point on the ground, the angles of elevation of the bottom and Top of a transmission tower fixed at the top of a 20 m high building are 45° and 60° respectively. Find height of the tower.
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" One must learn by doing the thing for though you think you know it,
you have no uncertainty until you try".